MIDDLE EAST LEPIDOPTERA: NEW FORMS AND SPECIES. VII.[1]

By E. P. Wiltshire, F.R.E.S.

The new forms and species here described were caught by the author within the last decade in Persia (Iran) and Mesopotamia (Iraq). More descriptions will probably follow, as the microscopic examination of the material proceeds. Acknowledgments are due to Dr B. P. Beirne, M. Charles Boursin, Mr W. M. T. Forbes, Brigadier Evans, and Mr Albert Zerkowitz for opinions, advice and assistance, and to the Bombay Natural History Society for the careful custody and packing of the author's 1939-42 material, which he is now able to study in New York.

Black-and-white illustrations, forming two plates, are given to illustrate the genitalia of some of the species mentioned; a third plate, in half-tone, illustrates those for which a photograph is considered also necessary for recognition. For these photos (except for one by Mr W. H. T. Tams) and drawings the author is responsible. For the gift of a microscope especial thanks are due to his uncle, Sir A. J. Curgenven.

Some photos of larvae and pupae, illustrating an article "Early stages of Oriental Palaearctic Lepidoptera—VIII," which follows this article, are also included in the third plate. A third article follows, "New Records of Lepidoptera from Iran—II," at the end of which appear the literary references made in the two articles which precede it.

Rhopalocera, Nymphalidae.

Melitaea sarvistana, Wilts., bona species.

Described and illustrated in Wiltshire (1941) as a race of *phoebe*, W.V., the question of the specific status of this beautiful and striking new Fritillary can now be cleared up as the result of an examination of the genitalia of the two types, of true S.W. Persian *phoebe*, W.V. and a comparison of the genitalia figured in Higgins' monograph (1941). *Sarvistana* is in the *phoebe* group, but quite distinct from both *phoebe* and *sibina*, Alph. This might really have been deduced from the facies, which is most distinctive on the upper side. I published it as a subspecies because I hesitated to suppose that I had, in fact, discovered three new species in a single Rhopalocera genus in one year in one province!

The male genitalia of *phoebe* and *sibina* are very similar but those of *sarvistana* differ as follows:—

Aedoeagus, not flattened anteriorly, of a more regular cylindrical form. Morula differs, as shown in figs. 5, 6, and 8, Plate II.

Ringwall, lightly chitined, so as to appear transparent.

Valvae: posterior processes less spreading and with only two points, not four as in *phoebe*.

Figures 7 and 9 show the dorsal and figures 1 and 2 the lateral view of the valvae of *phoebe* and *sarvistana*. The asymmetry of the new species' valvae should also be mentioned, the right valva being stronger, with longer and more elegant points on the posterior process.

The above distinctions are based on my examination of the genitalia of both the types, the only two known examples of this butterfly. There

[1]The previous article, No. VI, in this series appeared in *Ent. Rec.*, LVI, p. 97 (October-November 1944).

is no allotype, as originally stated, the second being a paratype; both are males.

Melitaea gina, Higg.

I take this opportunity to figure (fig. 3) the female genitalia of this species, since in the original description Higgins stated he could find no difference in the male genitalia from *didyma*, Esp. Fig. 4 shows the female genitalia of *didyma*, Esp., for comparison. The chief difference seems to be the taller cone below the antrum in *gina*. Dr Higgins, *in litt.*, said he would not like to assert that this difference was significant but admitted that none of his preparations of *didyma* showed quite the same development of the cone. He also told me that the male from Harir, W. Persia, figured by Peile as "*didyma casta*" (fig. 17) in the coloured plate in the March 1922 number of *Journ. Bombay N.H. Soc.* is this species. This plate indeed shows the typical underside characteristic of *gina* very well; the forewing upperside, however, is an aberration, with the submarginal chevron very underdeveloped. I find I have this species from the Elburz, thus confirming Brandt's statement *in litt.* that he got "*didyma*, O. ssp." (as he called it) from both N. and S. Persia.

Melitaea phoebe, W.V., ab. **fasciata**, ab nov.

This aberration is analogous to ab. *fasciata*, Skala, of *didyma*, Esp. The black discal spots are enlarged and united into a median fascia on the forewing upperside. The underside is normal. (Fig. d, Plate III.)

The type of the aberration is a male taken near Shiraz, Fars, S.W. Iran, on 12.v.40. It belongs to the Persian race which has not yet been named but is very close to mod. or ssp. *telona*, Fruhst. Presumably the new form could occur in other races. A normal example of the Fars race is also figured for comparison (fig. c).

Melitaea consulis, Wilts., ab. **proconsulis**, ab nov.

Upperside of both forewing and hindwing with submarginal chevron enlarged into a heavy black fascia. Between forewing nervures 3 and 4 the orange ground-colour basad of this chevron is absorbed by the black suffusion, so that the submarginal chevron or band is there united with the inner chevron or band, breaking up the orange interspaces into an apical group of three and an anal group of two. On both wings the median row of heavy black spots is obsolescent, and on the hindwing only one or two of these spots are present. I expect this abnormality of the median band occurs independently of the abnormality of the submarginal chevrons, and that *proconsulis* is therefore a combination of two aberrations. As though to compensate for the heavier submarginal chevron, the inner chevron on forewing and hindwing are lighter than in the normal female. (Figure a, Plate III.)

Holotype:—♀, 23.v.41, Kuh-i-Surkh, 8000 ft., near Shiraz, Fars, S.W. Iran. The type is a unique rather rubbed specimen, and is figured together with a male *consulis* for comparison; a typical female appeared in the original description's plate (Wiltshire, August 1941).

HESPERIIDAE.

Eogenes alcides, H.S., **elama**, subsp. nov.

The publication of this race rests on the brief preliminary description given in Wiltshire (December 1941) and the photo in the plate of

Wiltshire (December 1943). The following is the text of my original description prepared in 1938 but hitherto unpublished.

Above, dark brown, unmarked except for three small contiguous apical spots on the forewing in spaces 6 to 8; cilia, white.

Below, forewing, dark brown except for costa and apex broadly grey (apical spots as above; hindwing, entirely grey), with a small faint white spot in the middle of space 5; cilia, grey.

Length of forewing, 15.5 mm.; apex, rounded.

The genitalia, teste Brigadier Evans, are identical with those of *alcides*, H.S.

The typical form occurs in Asia Minor (Magnesia, Tokat, Aresh, etc.) and in Kurdistan, and differs from *elama* in having the forewing more pointed and with well-marked discal spots, and a cell-spot in the forewing. Minor subspecies resembling the typical form occur in Baluchistan and Chitral. A well-marked subspecies, *ahriman*, Christoph., occurs in Achal-Tekke; it approaches *elama* in size and has the forewing markings reduced but at least two discal spots are always present.

Type and only known specimen obtained has been deposited in the British Museum: from Maidan-i-Naftun, Khuzistan, S.W. Iran, 6.vi.38.

The name is intended to recall the ancient name for this province, Elam.

Heterocera, Lasiocampidae.

Trichiura **sapor**, sp. nov. (Fig. g, Plate III.)

This new species is the third known member of this Palaearctic genus and can easily be distinguished by its lack of markings from the other two.

Female: Antenna, bipectinated; shaft whitish, lamellae, ochreous, blackish at base.

Head and thorax, with long white and black hairs, producing a grey aspect. Abdomen, with heavy tuft of anal hairs, white predominating over grey and a few ochreous hairs.

Venation: the forewing apex comes at vein 9, not at 10 as in other *Trichiura*, sec. Seitz, but is so rounded that this is perhaps a matter of interpretation. On the forewings veins 6 and 7 are stalked, likewise 9 and 10. On the hindwing, 4 and 5 spring together from the cell; 6, 7, and 8 are free, the latter springing from the fore-edge of the cell and immediately curving boldly outwards to meet the costa at a very acute angle. Thus, except perhaps for the position of the forewing apex, the venation agrees with that of the two other *Trichiura* species. Antenna, frontal prominence and eyes also agree.

Forewing, whitish-grey, sparsely freckled with darker grey and black; palest in the submarginal area. No markings except a vague line running from the apex to the inner margin about 2 mm. from the inner angle; this line determines the paler submarginal area but is so obsolete as to be practically invisible; perhaps it is clearer in the male, which is not known to me. Underside, unmarked, with blackish scales denser towards apex.

Hindwing, similar in ground-colour to forewing, but darker grey towards termen. Underside, similar.

Fringes, long, pale, blackish near the tip, white-tipped.

Forewing length, 15 mm. Expanse, 30 mm.

Holotype:—♀, hatched 11.xi.41 from larvae found on *Amygdalus spartioides* at Shapur, 3000 ft., Fars, S.W. Iran. This locality is the site of the royal city of the Sassanian Emperor Shapur (*latine*, Sapor), hence the name for the new species. The early stages are described in greater detail in my article " Early stages of Oriental Palaearctic Lepidoptera, VIII," which follows immediately. In coll. m.

Chondrostega aurivillii, Püngl. (an *fasciana*, Stgr.), **feisali**, subsp. nov.

The publication of *feisali* was established by a brief description in Wiltshire (December 1941) and a figure in Wiltshire (October 1944, Bagdad). The following is my original description prepared in 1938 but hitherto unpublished.

♂, Forewing, about same size as *fasciana*, Stgr., or a little larger. Ground-colour, white, not pale brown as in *fasciana*. In well-marked specimens there is not only a brown median band but also a submarginal band (absent in *fasciana*) which proceeds from the apex and is usually more obsolete than the median. Often, however, both bands are obsolete, leaving the forewing almost pure white.

Hindwing, coloured like forewing, less strongly banded than in *fasciana*, Stgr., but in strongly-marked specimens there are two bands traceable, not one, as in *fasciana*.

Undersides; forewing, sometimes like *fasciana* (i.e. with median band clearly marked but submarginal band only clear near costa) but more often with the two bands united by a brown suffusion. Hindwing, basally whiter than outside the first band; this is so in *fasciana* too.

♀, wingless, at least 1 in. long, stout, covered with yellow-brown hairs and with a whitish anal tuft. Antenna, simple.

Herr Franz Daniel compared a paratype with the type of *aurivillii*, Pungl. He found the type more strongly marked than *feisali*, and with a light brown ground colour. Two whitish cross-lines, overshadowed with a light brown suffusion ran the same course as the cross-lines of *feisali*. The fringes in *aurivillii* were chequered light and dark brown, while in the *feisali paratype* they were white. This distinction, however, falls, since some *feisali* have fringes white chequered with brown. In *aurivillii*, again according to Daniel, the hindwing is light brown with two dark brown cross-lines, and fringes as on the forewing. The underside is similar, but stronger brown. These markings correspond to those of *feisali*, he found. Thorax, abdomen, and feet are similar in male *aurivillii* and *feisali*, though paler in the latter. The *feisali* female paratype is twice as big as Pungler's presumed allotype (it does not bear the " type " label, according to Daniel), otherwise similar. Daniel concluded that *feisali* was a large bleached race of *aurivillii*, and not a distinct species. If he is right the bleaching would denote the facies-reaction to more desertic conditions in Iraq than Palestine, a supposition confirmed by the Arabian form (see below).

I suspect, from this comparison with *aurivillii*, and my own comparison with Staudinger's type of *fasciana*, that *fasciana*, *aurivillii* and *feisali* are the same species, and each race varies somewhat in its habitat.

Examples taken by Philby in Arabia and deposited in the British Museum seem to belong to the same specific group. They are very large and completely satin-white. Travellers' accounts of red cater-

pillars swarming in *Arabia* agree with my own observations of *feisali* larvae in Iraq, at Kuwait, and in S.W. Persia.

Holotype:—♂, 31.ix.36, Haditha, Iraq (in coll. m.).

Allotype:—♀, 27.ix.37, hatched from larvae found at Qaraghan, Iraq (in coll. m.).

Paratypes:—8 ♂ and 3 ♀; 1.x.36, Baiji, Iraq or hatched 24-29.ix.37 from larvae found at Qaraghan, Iraq, or 14.x.38, Hamidiya, near Ahwaz, Khuzistan, S.W. Iran (in coll. m. et coll. Daniel).

Named in memory of King Feisal I of Iraq.

A description and photo of the larva and cocoon appears in "Early Stages of Oriental Palaearctic Lepidoptera, VIII," which follows immediately.

Cossidae.

Dyspessa bipunctata, Stgr., **brandti**, subsp. nova.

A brief preliminary description of this high-altitude race appeared in Wiltshire (October 1944, Bagdad). A more complete account of it and of subsp. *marginepunctata*, Wilts., which was rather too briefly described in *Ent. Rec.*, 15.x.39, p. 135, Vol. LI, follows hereunder, and a plate illustrates both (Figs. e and f) though Fig. f does not do justice to the different ground-colour of the new race.

	bipunctata.	*marginepunctata.*	*brandti.*
Tarsi, banded with	? Black	Black	Brown
Forewing, ground-colour	Bone-yellow	White	Smoky-cream
Forewing, termen with	No spots*	12 black spots invariably marking the nervures	12 brown spots, but those marking nervures 10-12 (i.e., costal) are sometimes black
Forewing, cell with	2 black spots*	2 black spots	2 faint brown spots, the upper obsolete
Forewing, median-spot above nervure 1	Black*	Black	Brown
Hindwing, ground-colour	Greyish-white, sometimes darker marginally	White	Smoky-grey

The sexes do not differ much in appearance, except that the ♀ ovipositor is conspicuous. Variation in size is considerable. In the Zagros I know of no locality producing transitional forms between the above races, though it would be reasonable to look for transitions between my two races at upper middle heights. In the N. Zagros (Rowanduz region) *brandti*, or something very like it, occurs above 4000 ft. and *marginepunctata* at lower level. In the Middle Zagros, *marginepunctata* occurs at 200 ft. (Ahwaz in April) and up to an unascertained height; at about 30° N., however, *bipunctata* inhabits the wooded Pireh-Zan (7000 ft.) and the scrubby Sineh-Sefid (6000 ft.), while *brandti* inhabits the barer Ardekan region (7000 ft. and higher). The Brandt brothers were the first to take and remark on this smoky high-altitude form, but did

*At Marash (S.E. Turkey), to judge from Daniel's account, a transitional form between *bipunctata* and *marginepunctata* occurs; in it the black spotting is variable in extent, but the yellow ground-colour is retained. Perhaps this is really the nymotypical form, for Staudinger described from an inadequate series.

not name it; their locality for it was Comay (Barm-i-Firuz) near Ardekan.

Holotype and paratype of *brandti*:—♂♂, 29.vi.41, Ardekan, fruit-gardens, 7000 ft. Fars, S.W. Iran. In coll. m.

A longer series would probably indicate that the spotting in *brandti* is variable in extent, as in *bipunctata*.

Agrotidae.

Acronycta psi, L., **tehrana**, subsp. n. an sp. bona?

This moth differs from *psi* obviously in the larva and less obviously in the genitalia. Until *psi*'s geographical variation in these particulars is better known and until I can examine the genitalia of *solimana*, Draudt I hesitate to describe *tehrana* as definitely a new species. Draudt described *solimana* from Vandarban, 6000-7000 ft., N. Iran, as a subspecies of *psi* after examining the genitalia; he said it had " quite grey-brown hindwings, even in the male," which cannot apply to *tehrana*.

Male:—Antenna, simple, white, with black keel and bands. Palp, grey, black below.

Thorax, with dark grey central parting to patagia and black lateral edge to tegulae (as in *cuspis*, Hübn.). Forewing, as in *psi*. Hindwing, dirty white, glossy, the nervures light brown-grey and termen similarly indicated between the nervures except at the anal corner, where the white ground-colour is purer.

Underside, both wings, with discal spot large and clear, and post-median line clear at forewing costa; nervures, pale brown, fringes, chequered in blackish between the nervures. Span, 38 mm.

Male genitalia: the uncus-tip in *tehrana* has a fine point lacking in European *psi*, and the valva is more tapering; the cornuti of aedoeagus, furthermore, are slenderer and denser in *tehrana*. (Figs. 10 and 11 show the difference in the shape of the valvae). By themselves these differences might be of only geographical significance, but when considered together with the other differences (larval colouring and *cuspis*-like thorax) they suggest that a distinct species may be in question.

Holotype: ♂, hatched on 8.v.40 from a larva with a *blue* dorsal stripe found on elm at Tehran at 5000 ft. in 1939. In coll. m. A photo and fuller description of the larva appears in " Early Stages of Oriental Palaearctic Lepidoptera, VIII," which follows.

Anchoscelis plumbea, Wilts., bona species.

An examination of the male genitalia of the types of this moth, described in Wiltshire (1941) as a subspecies of *macilenta* shows it to be a distinct species, closely related to *lota*, L. It differs from the latter chiefly in the form of uncus (see figs. 12 and 13) and also in the greater length of the aedoeagus. In *lota* this is the same length as the *valva* but in *plumbea* it is slenderer than that of *lota* and measures 0.5 mm. longer than the valva, owing to the greater fullness of the *caecum penis*, or bulb.

The brick-red form occurring in Kermanshah, which is superficially so like *macilenta*, ssp. *rubrescens*, Wilts. (from Syria) that I recorded it as such in Wiltshire (1940) and again in 1945, proves to be conspecific with *plumbea* and I describe it below. Appropriate corrections should be made in my 1940 and 1945 works.

Anchoscelis plumbea, ssp. **convergens**, forma nova.

Differs completely in colour from the nymotypical form from S. Zagros, which is buff heavily clouded with lilac grey; because of its reddish coloration it can be mistaken for *rubrescens*, Wilts., which, however, is a true *macilenta* form (see fig. 14 for its uncus). It is probably a good race, characteristic of the Central and Northern Zagros, though only one specimen is known. This is yet another example from the Middle East of convergence in facies of structurally distant species (the genus *Caradrina* is especially rich in similar cases). The term "mimic" is inappropriate to these cryptically-coloured moths, and the new race's name indicates the nature of the phenomenon. In this case, the two similar forms are not yet known to occur together.

♂, Palp, with rosy-buff and a few black hairs. Thorax, rosy-buff, paler in front. Forewing, ochreous buff, thickly sprinkled with rosy-purple scales, giving a general brick hue; paler towards base. Ante- and post-median lines, faint, purer buff, with faint rosy-purple basad edging. Submarginal line, similarly but more brightly coloured, and straighter, running as in *lota*. Stigmata similarly outlined, but faintly, except lower lobe of reniform, where line is yellow and lobe filled with dark grey. Central shade, vague, grey; space between postmedian and submarginal line grey-suffused, with grey basad, yellow terminad, dots marking the nervures. Submarginal field suffused with purple-grey, the nervures indicated on it in grey and yellow. Termen, wavy, buff. Fringes, rosy brown. Hindwing, dark grey-brown, with discal spot and nervures slightly darker. Termen buff, fringes pale brown and grey. Undersides: forewing, grey suffused up to the submarginal line, with costa and submarginal field paler; fringes rosy. Reniform stigma, grey. Postmedian line clearly marked on both wings; discal spot and submarginal line also clearly marked on hindwing underside.

Holotype:—♂, 4.xi.39, Kermanshah, 5000 ft., W. Iran. Garden with willows. In coll. m.

Hypeninae.

Tamsola **tarda**, sp. n. (Fig. h).

It is hoped in a subsequent part of this series to publish a full description of this small (18 mm.) interesting new species, which has the typical Zagros coloration and pattern found in so many different families (convergence), i.e., blackish or brownish bands on a creamy-white ground. Meanwhile, the photograph, for which I am indebted to Mr Tams, will serve. The unique type, taken at Rowanduz Gorge, Kurdistan, N.E. Iraq, is at present in the British Museum, as far as I know.

Geometridae.

Cidaria polygrammata, Borkh., **rosea**, forma nova.

The typical Middle East *polygrammata*, as represented by Bagdad and Tehran specimens, is very pale but well-marked; this new form, possibly a good race, and at least a very striking aberration, differs by its beautiful and durable rosy suffusion of the whole forewing, and by the slate-blue colour of the median field in the ♀ forewing. (I have no male of *rosea*; the species is sexually dimorphic, the male having the median field less marked).

Other differences:—Abdomen, strongly marked dorsally with dark brown scales on somites 3-7 (cf. Tehran form, with only abdominal tergite 3 so marked, and that weakly); a general warmer brown coloration on thorax, head and hindwing, as well as the forewing, which is rosy. The discal spot and the postmedian row of blackish marks on the nervures are weak, especially on the upper side.

Holotype:—♀, 21.iii.41; Shapur (3000 ft.), near Kazerun, Fars, S.W. Iran. Oasis biotope, riverside vegetation. In coll. m.

(To be continued—2 parts and 3 plates.)

THE WINTER REARING OF ARGYNNIS EUPHROSYNE.

By T. D. Fearnehough.

A supply of ova of the "Pearl-bordered Fritillary" (*A. euphrosyne*) was obtained in June 1945 from three females taken in N. Lancashire. The ova duly hatched and the grubs were fed on garden *Viola*. The larvae reached their hibernation stage towards the end of July and stopped feeding.

Efforts were made to persuade them to feed on. The larvae, most of which tried to settle down for hibernation on the roof of their cage, were repeatedly disturbed, and a supply of fresh food was always available. They refused to eat, however, and when moved on to the food-plant soon found their way back to the cage roof. The temperature was raised artificially in daily stages to 85/90° F., 95/100° F., and 100/105° F. respectively. To the last temperature the larvae were submitted for two days, but none of them showed any inclination to recommence feeding.

These attempts to induce the *euphrosyne* larvae to forego the hibernation period having failed, they were "cooled-off" and transferred to hibernation quarters. A clean 3 in. plant pot was ground flat on the top edge, by rubbing on emery paper, so that a flat glass cover gave good contact all round. The bottom hole was plugged with cotton wool and the plant pot was filled with crumpled-up pieces of filter paper. The *euphrosyne* larvae were dropped in and they soon searched out suitable crannies in the filter paper where they settled down for their winter's rest. The plant pot was covered with a piece of flat glass and placed in a cool cellar which has a Summer temperature range of 45/55° F.

The larvae were left undisturbed for about three months. In early November two of the larvae were taken from their hibernation quarters and warmed up to a temperature of 65/70° F. They soon became active and explored the *Viola* leaves provided. They did not appear to eat for two days but on the second day excreta were observed in the tin in which they were housed, and on the third day they were feeding heartily. They soon spun silken mats and fixed themselves for moulting. Having changed skins, and incidentally become most beautiful creatures, they fed voraciously and soon attained full growth. They both pupated on 24th November, and the butterflies, two fine typical females, emerged on 6th and 7th December.

After this preliminary success a further sixteen larvae in two batches of eight were taken from hibernation and submitted to a temperature of 65/75° F. These commenced feeding during the first 24 hours and